

Sub D'7  
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1 1. (twice amended) A routing system for distributing packets in a network, wherein the  
2 packets originate at a source and are returned to a destination, both source and destination  
3 external with respect to the routing system, comprising:  
4 a plurality of means for transferring packets to a destination and from a source;  
5 a plurality of route processing engines; and  
6 a mechanism that performs a hashing function on at least a portion of network  
7 layer information, in the packets transferred to the routing system, to determine an ap-  
8 proximately even distribution of the packets to the route processing engines for process-  
9 ing by the engines, and  
10 means for determining packets belonging to a same flow and their original order  
11 from the network layer information of the packets, the network layer information includ-  
12 ing at least the same source/destination and protocol,  
13 means for preserving the original ordered packet flows by sending each ordered  
14 packet flow to a single route processing engine.

1 2. (twice amended) The routing system of claim 1, wherein the plurality of means for  
2 transferring packets includes at least one uplink connection to an external network and at  
3 least one data port adapter connected to an external data interface component.

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B2 Sub D2

1 11. (twice amended) A routing system for distributing packets in a network, wherein the  
2 packets originate at a source and are returned to a destination, both source and destination  
3 external with respect to the routing system, comprising:

Sub 2  
cont.

4 a plurality of network interfaces that transfer the packets to a destination and from  
5 a source;

6 a plurality of route processing engines;

7 a fabric interconnecting said plurality of network interfaces and said plurality of  
8 route processing engines;

9 wherein each of said plurality of network interfaces uses a hashing function to  
10 determine a distribution of the packets among said plurality of route processing engines;  
11 and

12 wherein the hashing function is carried out on at least a portion of network layer  
13 information in the packets, and

14 wherein the hashing function determines packets belonging to a same flow, and  
15 their original order from the network layer information including at least the same  
16 source/destination and protocol, and

17 means for preserving the original ordered packet flow by sending the original or-  
18 ~~dered packet flow to a single route processing engine.~~

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1 17. (twice amended) A method for selecting one processing engine of a plurality of proc-  
2 essing engines for processing at least one packet, the method comprising the steps of:

3 hashing at least a portion of network layer information of at least one packet to  
4 determine a distribution of the packets to be sent to the processing engines;

B3

5 determining from the network layer information, including at least the  
6 source/destination and protocol, the at least one packet that belongs to an ordered packet  
7 flow, and  
8 selecting one processing engine to process the at least one packet that belongs to  
9 an ordered packet flow, thereby preserving the ordered packet flow.

10 20.(amended) The method of claim 17, wherein the hash value is computed by logically  
11 XORing the addresses, the port, and the protocol type value.

12 21.( amended) The method of claim 17, further comprising the steps of:  
13 providing a table containing entries for use in selecting the one processing engine;  
14 and  
15 selection one entry in the table specified by an index value, the index value being  
16 based upon the hash value, and  
17 using the index value to direct the selection of the one processing engine for those  
18 related packets that belong to the same packet flow.

19 25.(amended) The method of claim 17, wherein the at least one original ordered flow  
20 comprises a plurality of original ordered flows, and the step of hashing is performed such  
21 that only a single respective processing engine is selected to process respective packets  
22 belonging to a respective original flow.

SUB #7

1 26. (amended) A system for selecting one processing engine of a plurality of processing  
2 engines for processing at least one packet, the system comprising:  
3 means for hashing at least a portion of network layer information of the at least  
4 one packet, and determining therefrom a distribution of the packets to be sent to the proc-  
5 essing engines, and determining therefrom packets and their order that belong to a same  
6 flow, wherein the information comprises one or more of the following network informa-  
7 tion: a network source address of the at least one packet, a network destination address of  
8 the at least one packet, a source port of the at least one packet, a destination port of the at  
9 least one packet, and a protocol type value of the at least one packet, and  
10 means for selecting the one processing engine based upon, at least in part, the  
11 portion of the network layer information in such a way as to preserve an original packet  
12 flow comprising the at least one packet.

1 34. (amended) The system of claim 31, wherein the at least one original ordered flow  
2 comprises a plurality of original ordered flows, and the means for hashing carries out the  
3 hashing such that only a single respective processing engine is selected to process re-  
4 spective packets belonging to a respective original ordered flow.

1 35. (amended) Computer-readable memory comprising computer-executable program  
2 instruction for selecting one processing engine of a plurality of processing engines for  
3 processing at least one packet, the instructions, when executed, causing:

4 hashing at least a portion of network layer information of the at least one packet,  
5 and determining therefrom a distribution of the packets to be sent to the processing en-  
6 gines, and determining therefrom packets and their order that belong to a same flow,  
7 wherein the network layer information comprises one or more of the following a network  
8 source address of the at least one packet, a network destination address of the at least one  
9 packet, a source port of the at least one packet, a destination port of the at least one  
10 packet, and a protocol type value of the at least one packet, and  
11 selecting of the one processing engine based upon, at least in part, the portion of  
12 the network layer information in such a way as to preserve an ordered original packet  
13 flow comprising the at least one packet.

1 37.(amended) Memory of claim 35 wherein the examining comprises hashing the portion  
2 of the network layer flow information to produce a hash value, and the hash value is used,  
3 at least in part, to select the one processing engine.